

EXPANDABLE WELLBORE JUNCTION

Inventors: John C. Gano, Tommie A. Freeman, John S. Bowling and James R. Longbottom

Attorney Docket No.: 970194U1D1R1D2USA Attorney: KONNEKER & SMITH, P.C. Phone: (972) 516-0030

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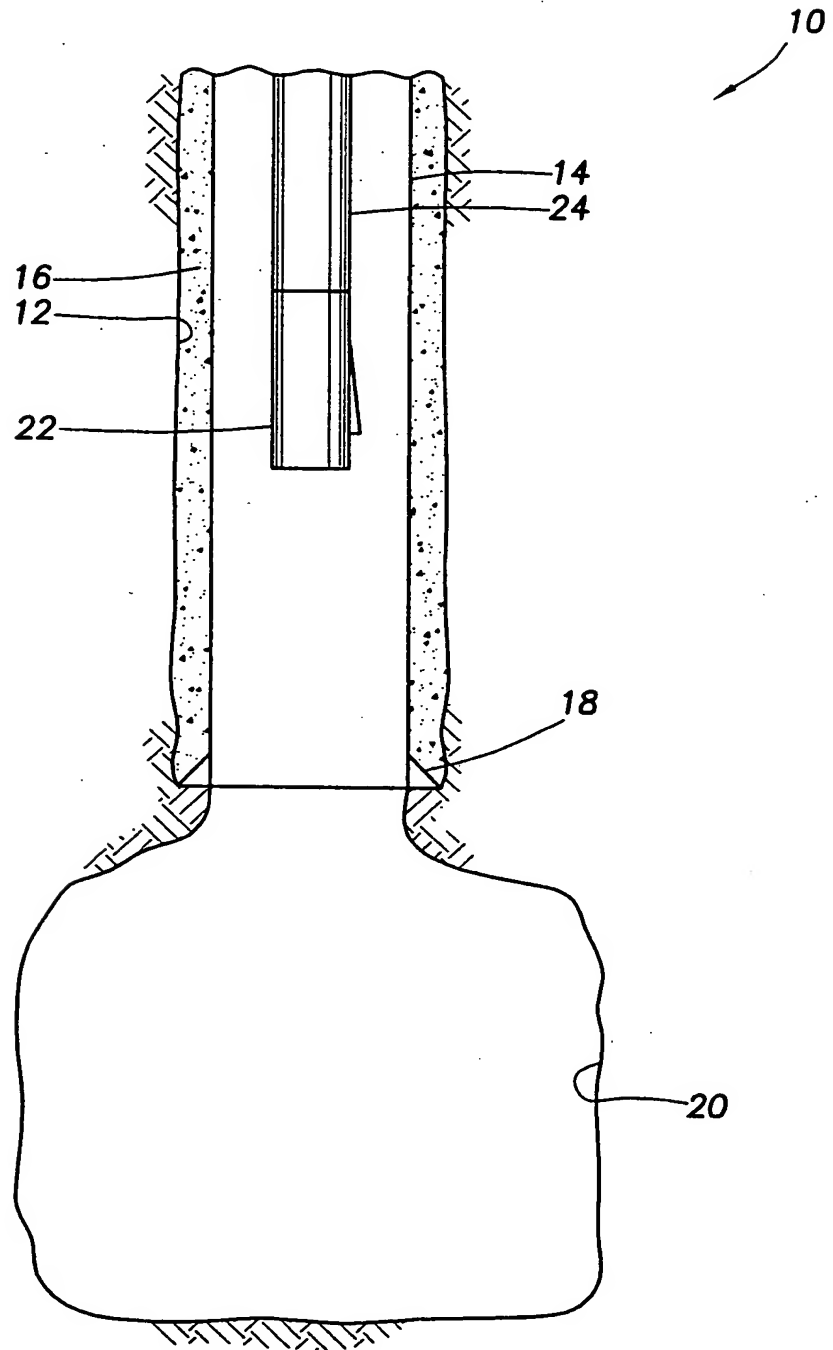


FIG. 1A

EXPANDABLE WELLBORE JUNCTION

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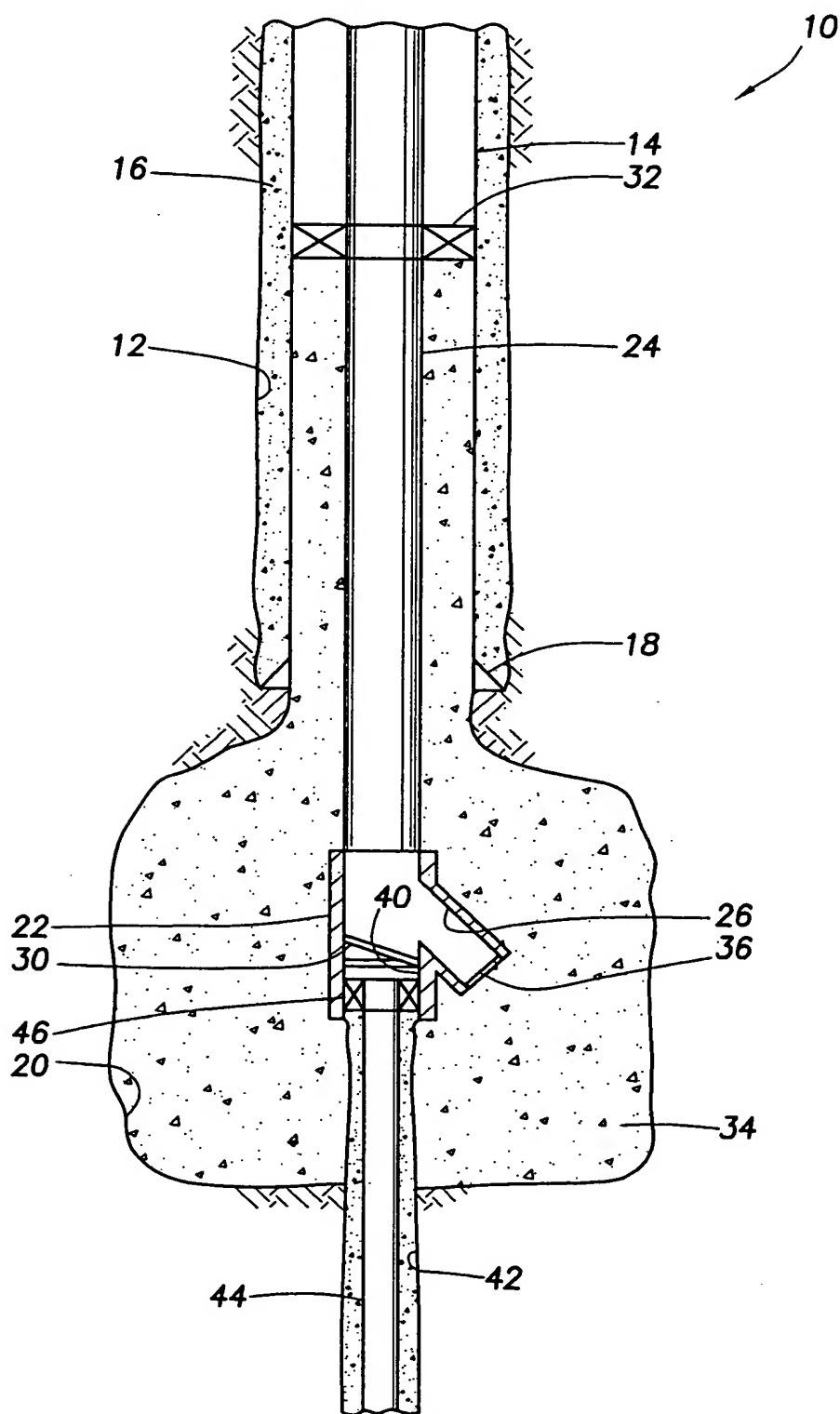


FIG. 1B

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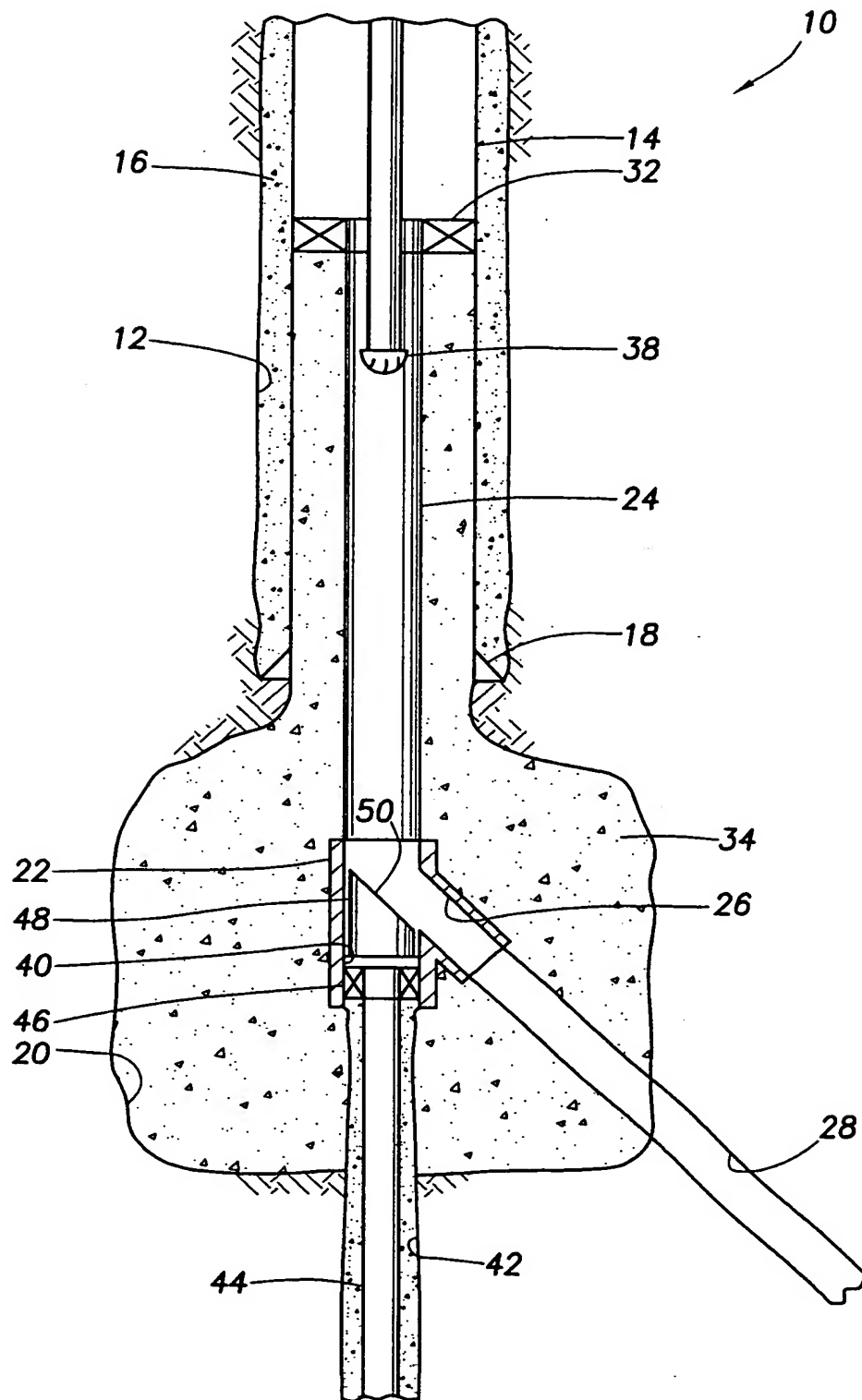


FIG. 1C

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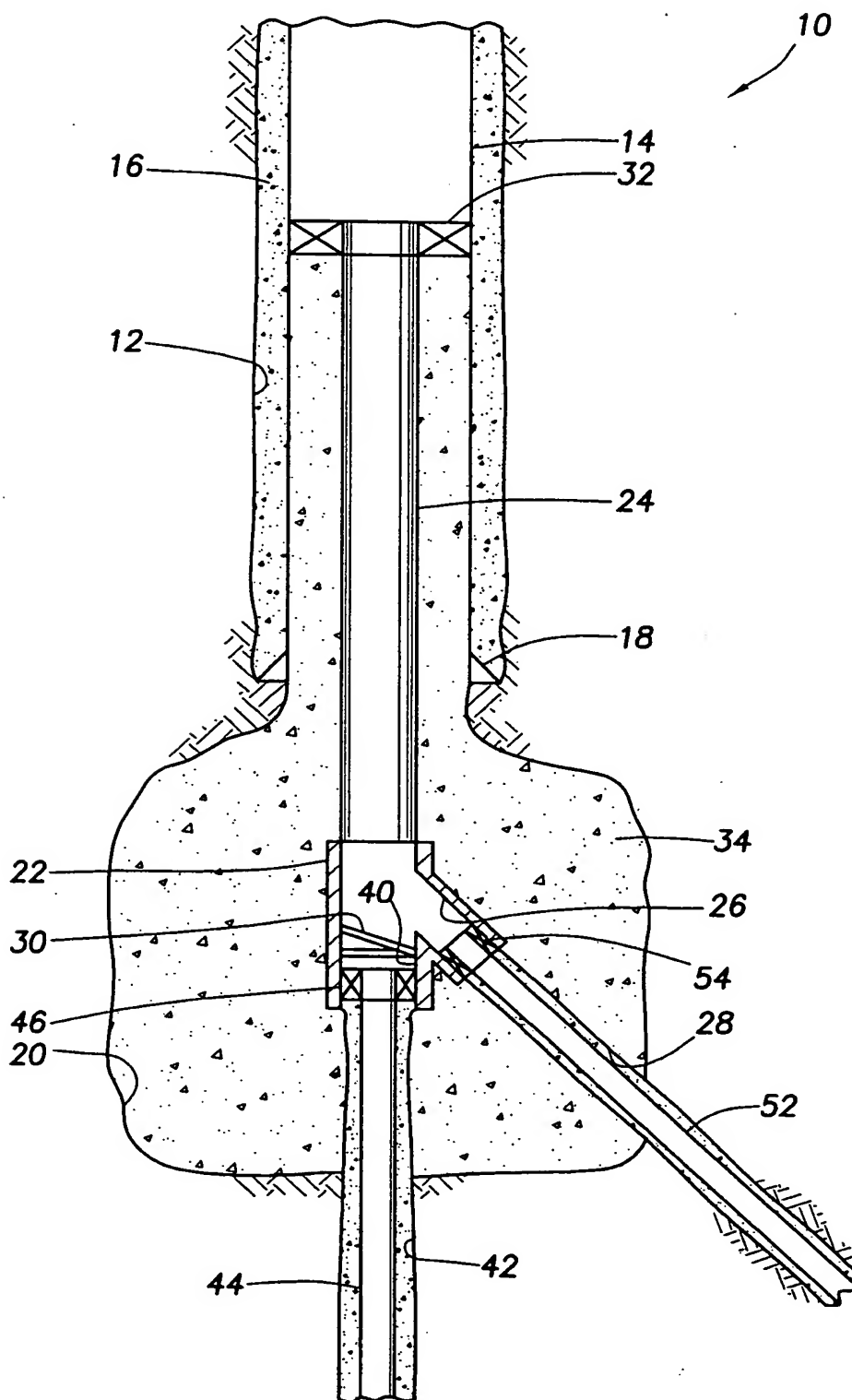


FIG. 1D

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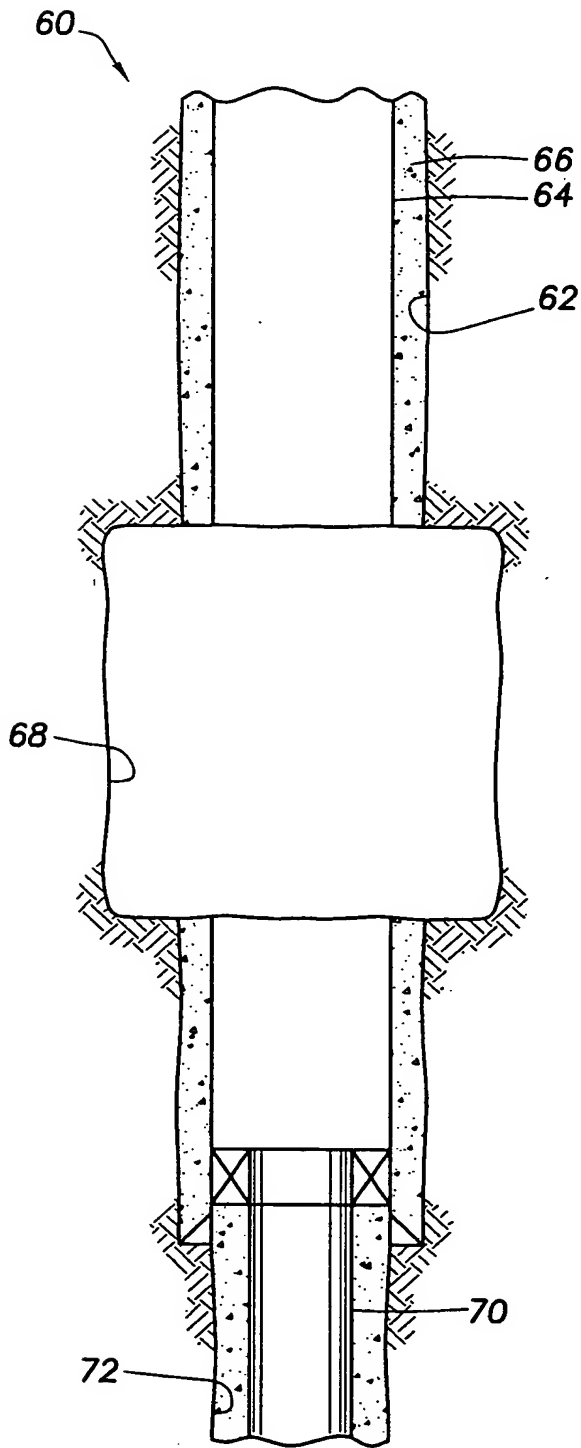


FIG. 2A

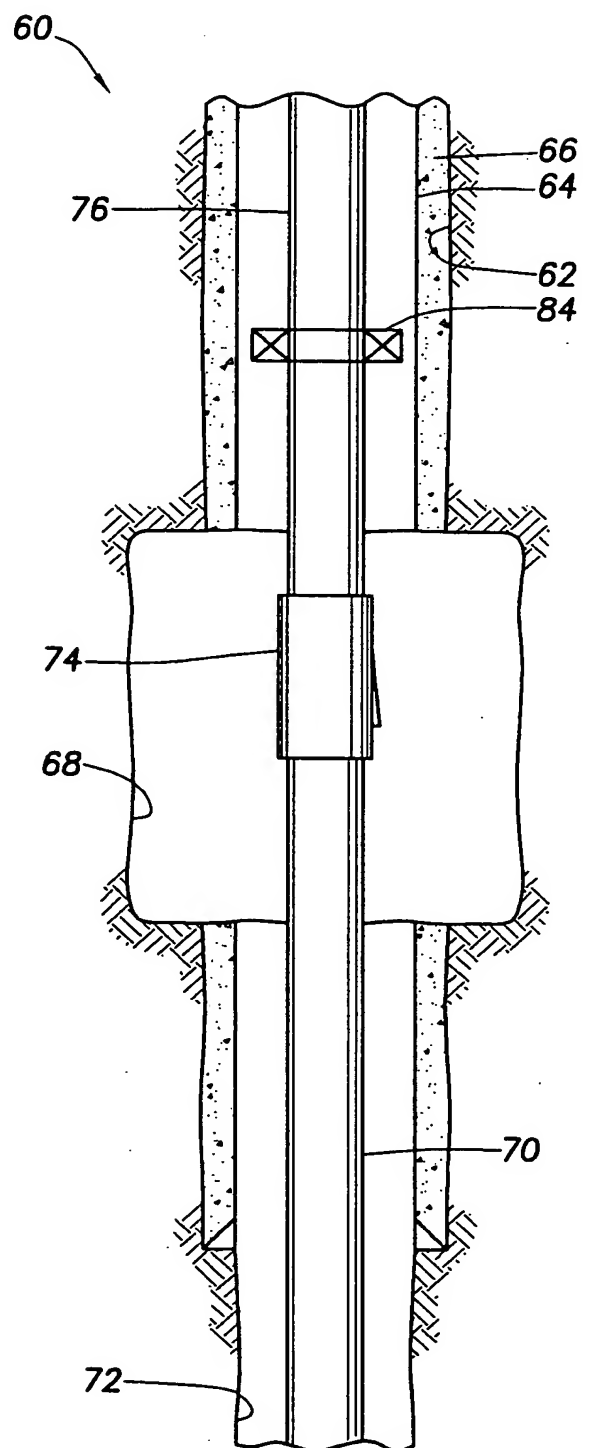


FIG. 2B

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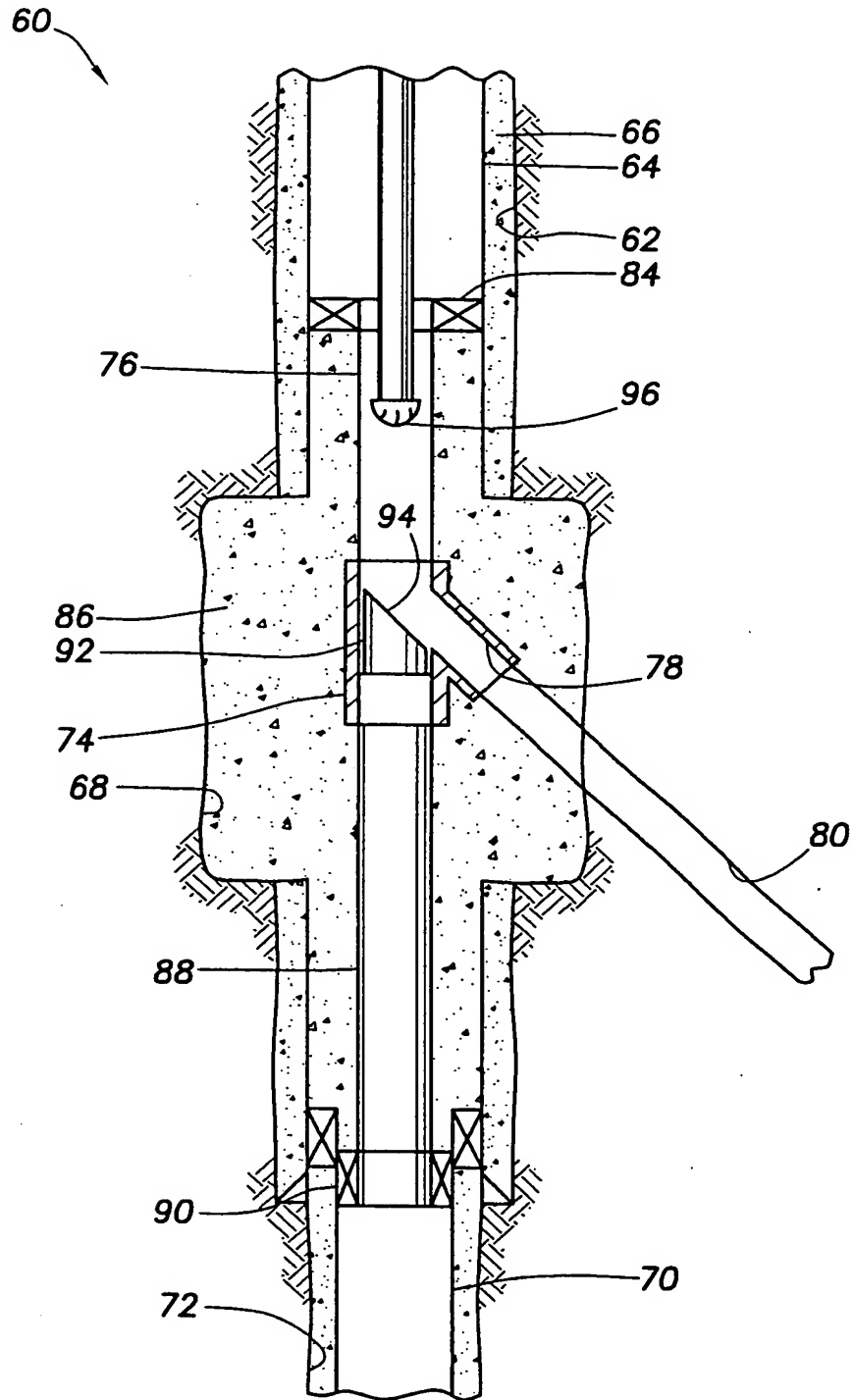


FIG. 2C

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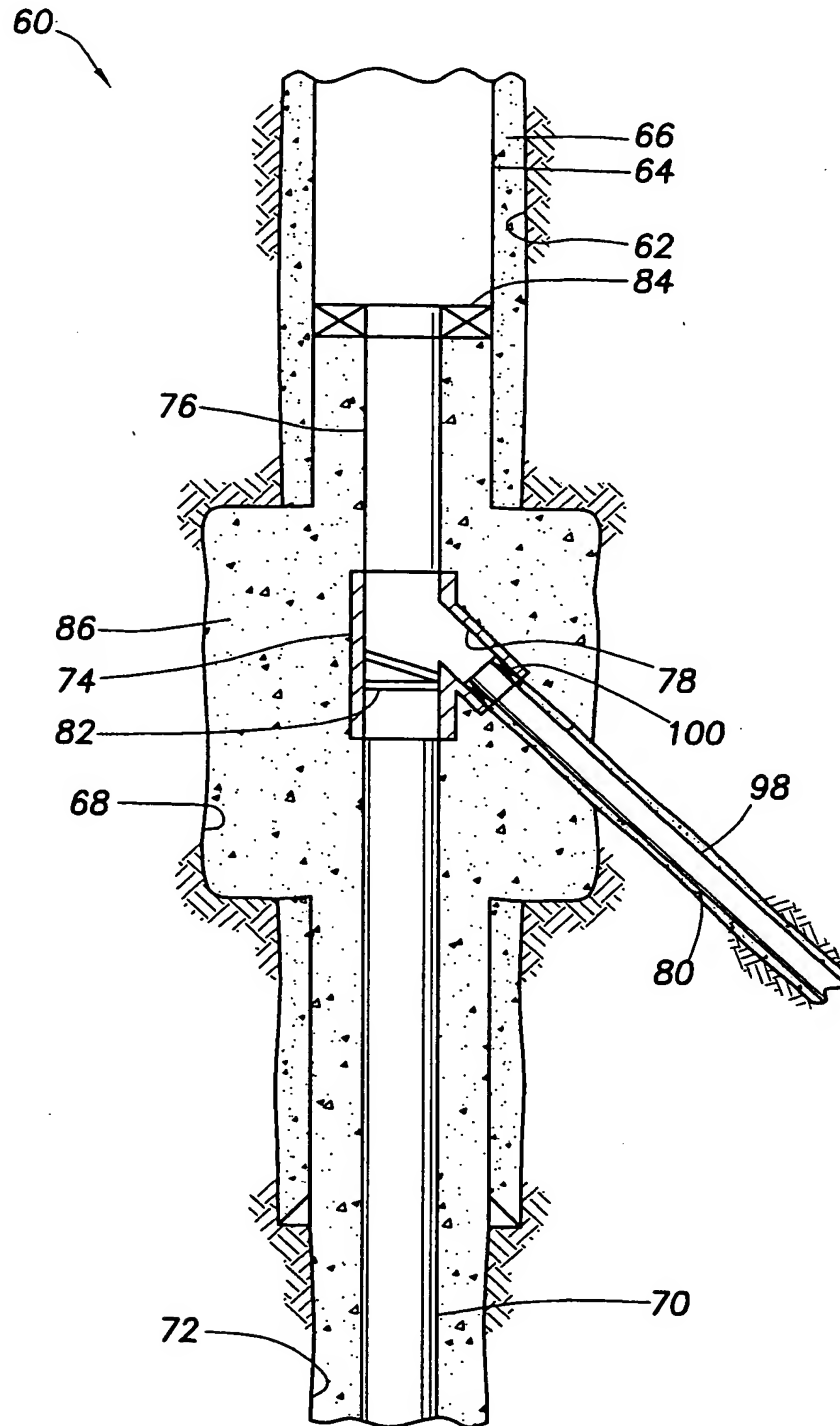


FIG. 2D

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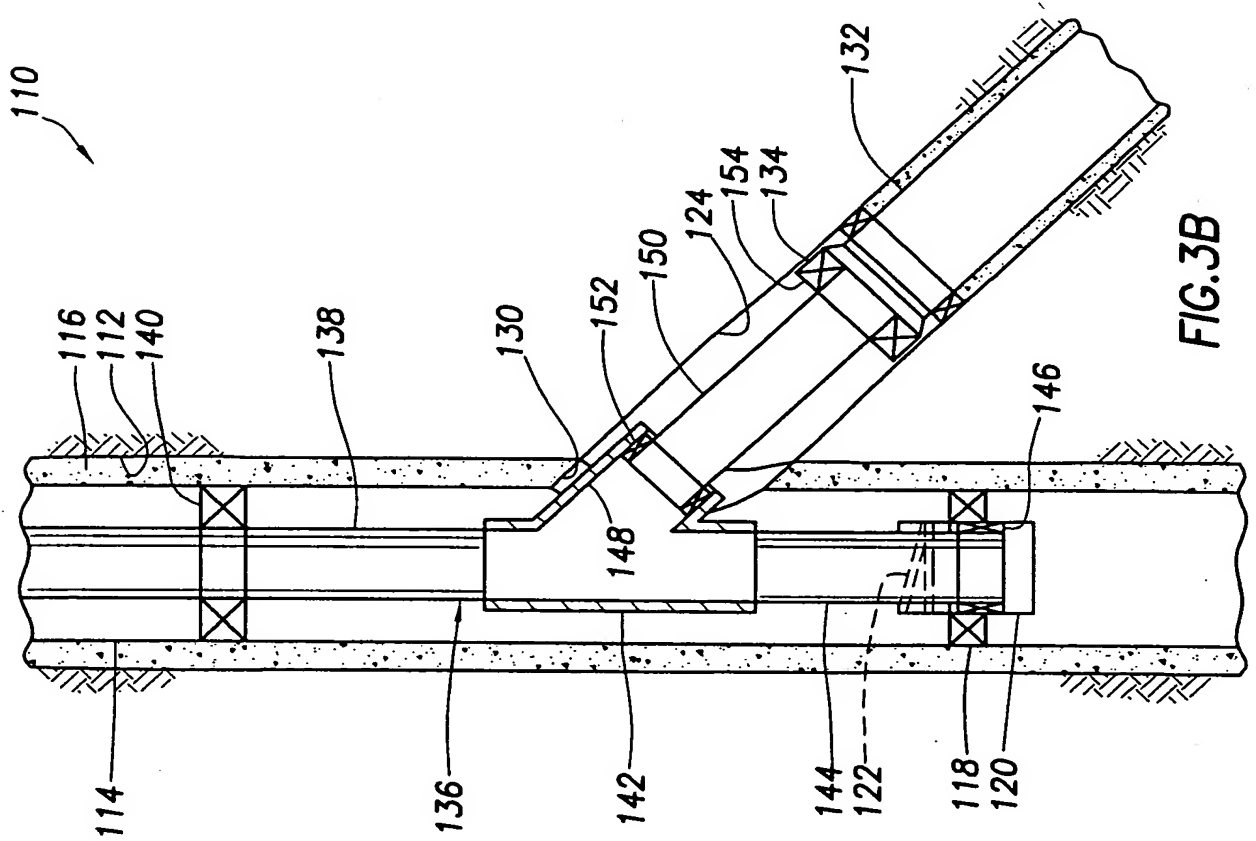


FIG. 3B

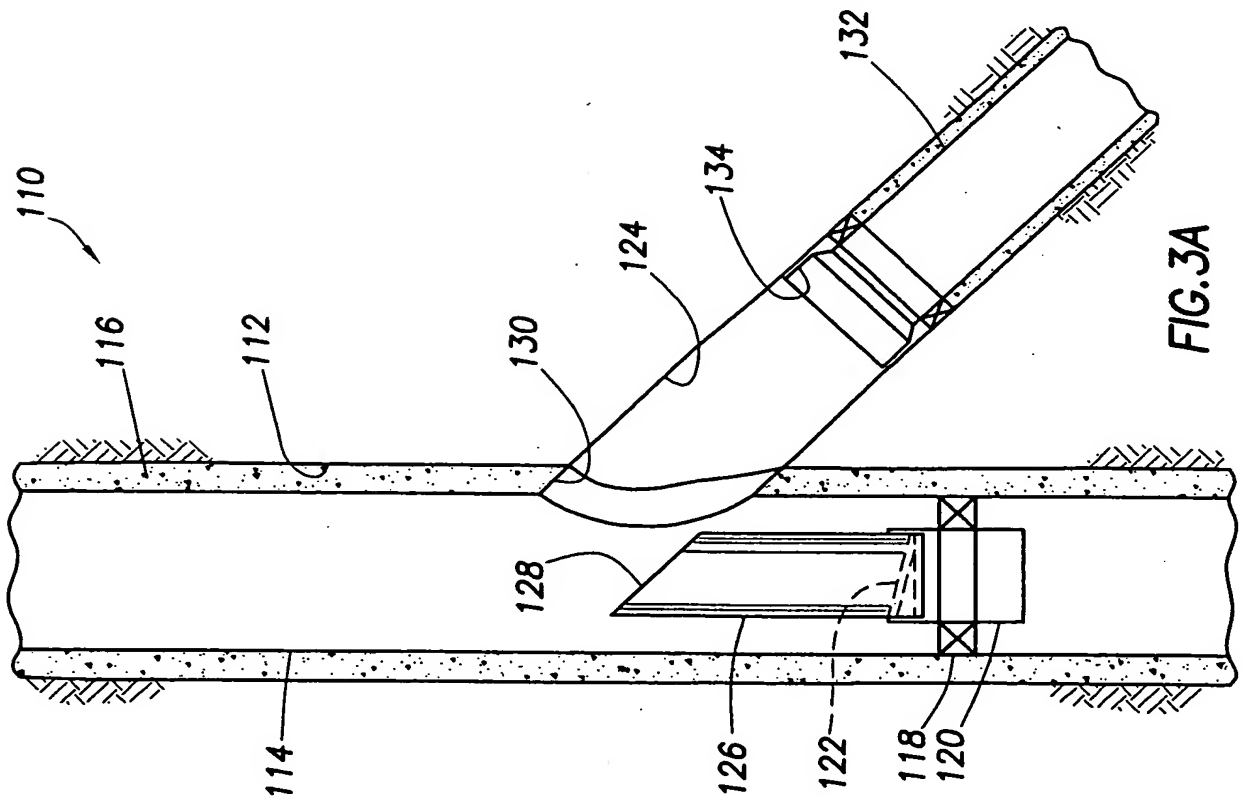


FIG. 3A

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FIG. 4A and FIG. 4B are cross-sectional views of a multi-layered structure, likely a semiconductor device or a microfluidic chip. The structure consists of several layers and components, labeled with reference numerals.

FIG. 4A: This view shows a cross-section of the device. A central channel (172) is formed by a series of layers. The top layer (114a) is a substrate. Below it is a layer (116a) containing a patterned region (112a). A layer (168) is deposited over the patterned region, and a layer (164) is deposited over the layer (168). A layer (170) is deposited over the layer (164). A layer (176) is deposited over the layer (170). A layer (190) is deposited over the layer (176). A layer (130a) is deposited over the layer (190). A layer (180) is deposited over the layer (130a). A layer (186) is deposited over the layer (180). A layer (124a) is deposited over the layer (186). A layer (166) is deposited over the layer (124a). A layer (134a) is deposited over the layer (166). A layer (132a) is deposited over the layer (134a). A layer (172) is deposited over the layer (132a). A layer (182) is deposited over the layer (172). A layer (162) is deposited over the layer (182). A layer (188) is deposited over the layer (162). A layer (118a) is deposited over the layer (188). A layer (120a) is deposited over the layer (118a).

FIG. 4B: This view shows a cross-section of the device, similar to FIG. 4A but with a different internal structure. The top layer (114a) is a substrate. Below it is a layer (116a) containing a patterned region (112a). A layer (168) is deposited over the patterned region, and a layer (164) is deposited over the layer (168). A layer (170) is deposited over the layer (164). A layer (176) is deposited over the layer (170). A layer (190) is deposited over the layer (176). A layer (130a) is deposited over the layer (190). A layer (180) is deposited over the layer (130a). A layer (186) is deposited over the layer (180). A layer (124a) is deposited over the layer (186). A layer (166) is deposited over the layer (124a). A layer (134a) is deposited over the layer (166). A layer (132a) is deposited over the layer (134a). A layer (172) is deposited over the layer (132a). A layer (182) is deposited over the layer (172). A layer (162) is deposited over the layer (182). A layer (188) is deposited over the layer (162). A layer (118a) is deposited over the layer (188). A layer (120a) is deposited over the layer (118a).

FIG. 4B

FIG. 4A

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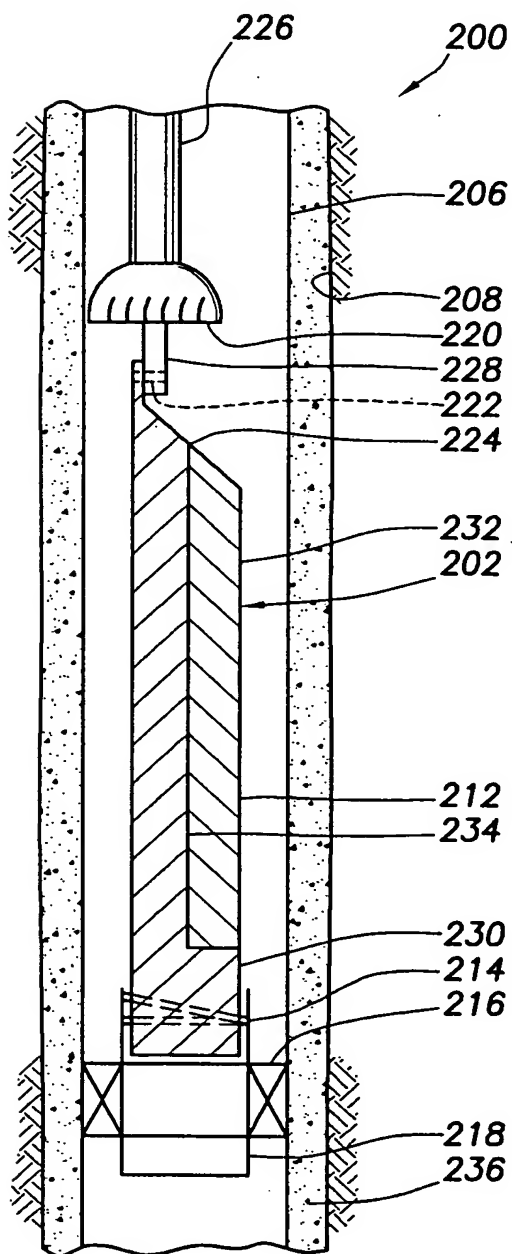


FIG. 5A

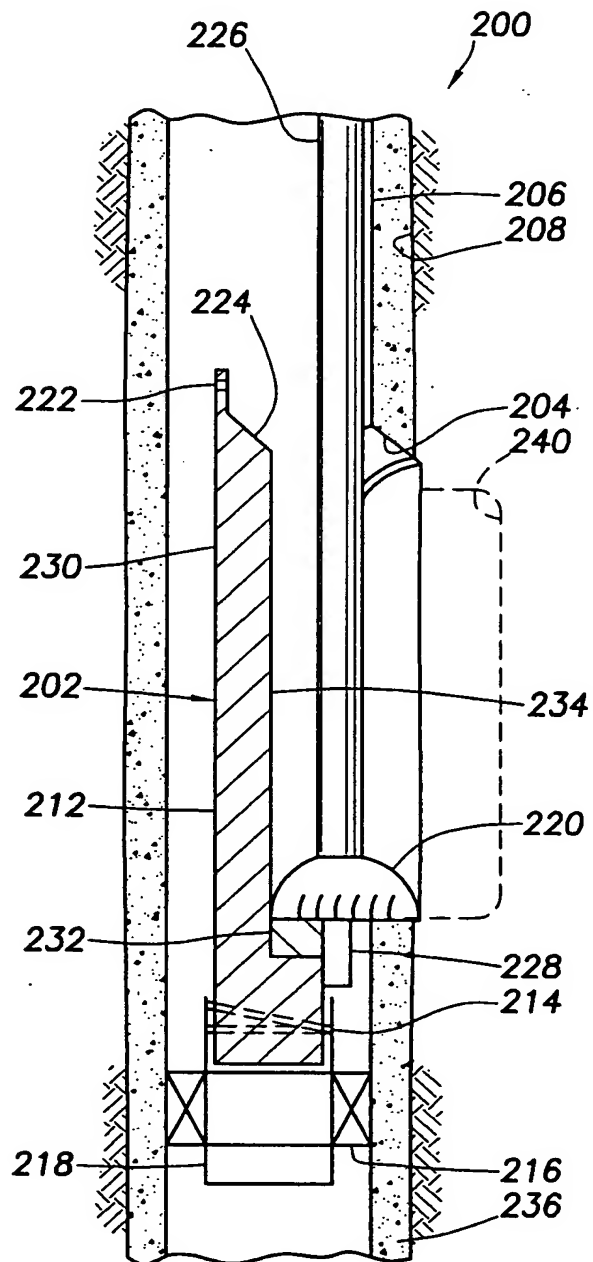


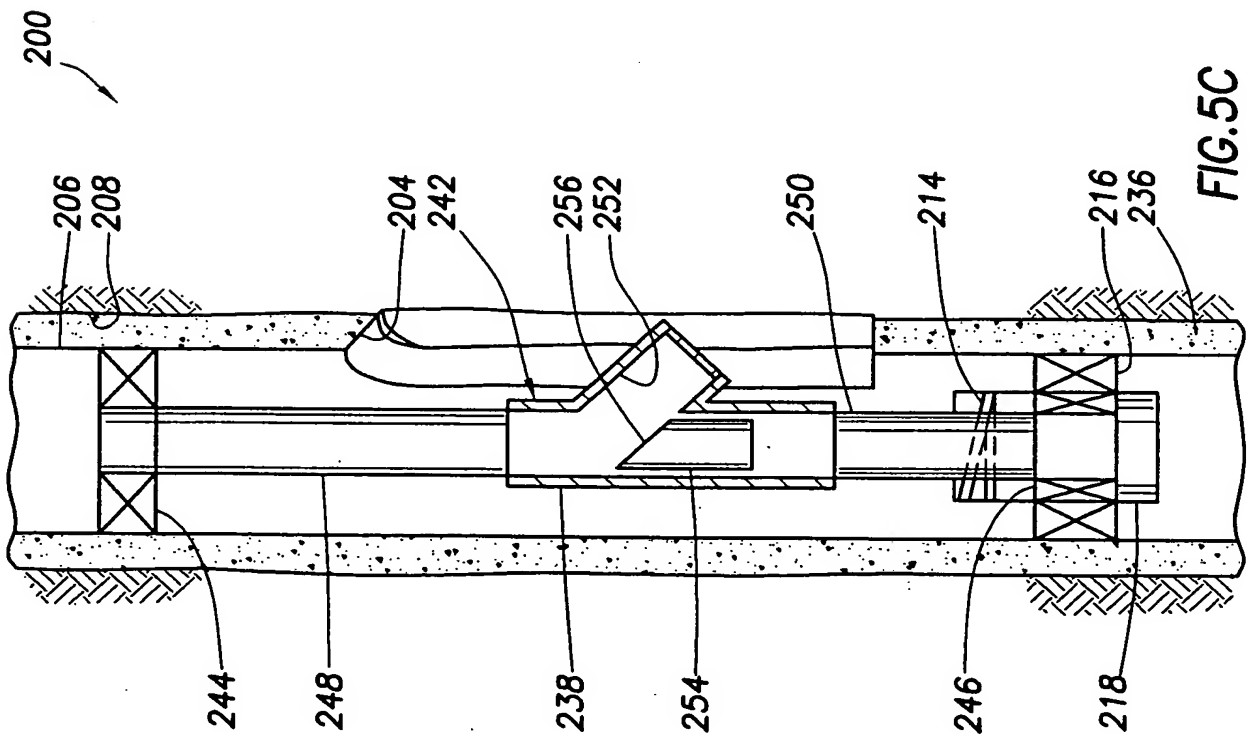
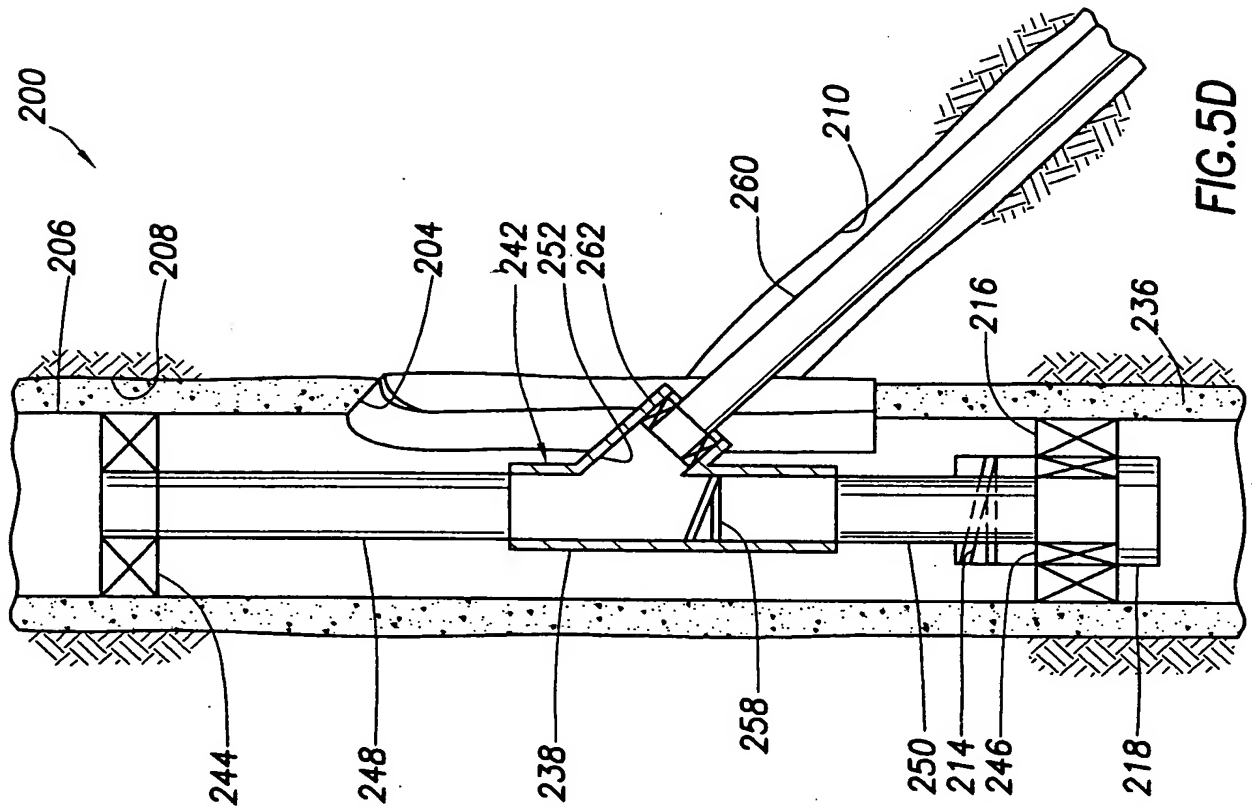
FIG. 5B

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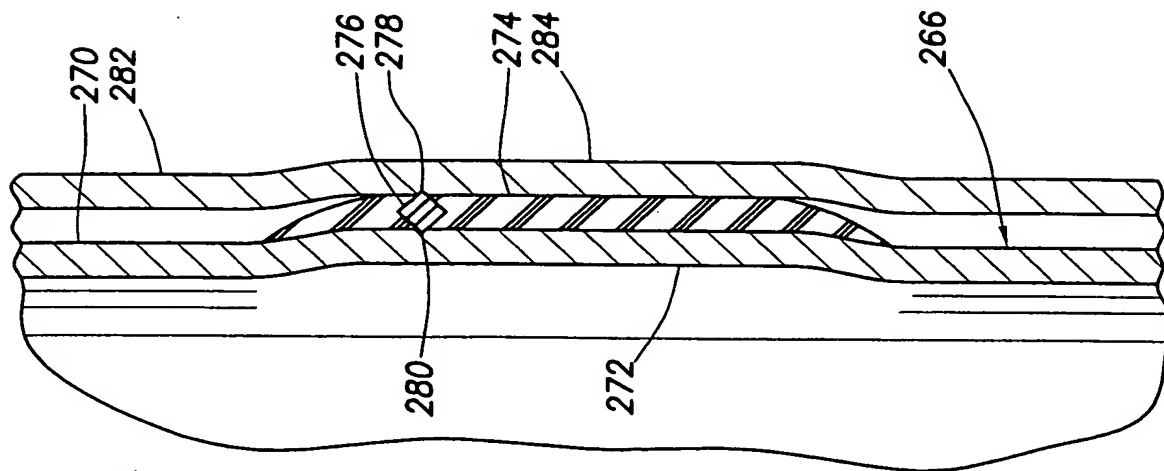


FIG. 6A

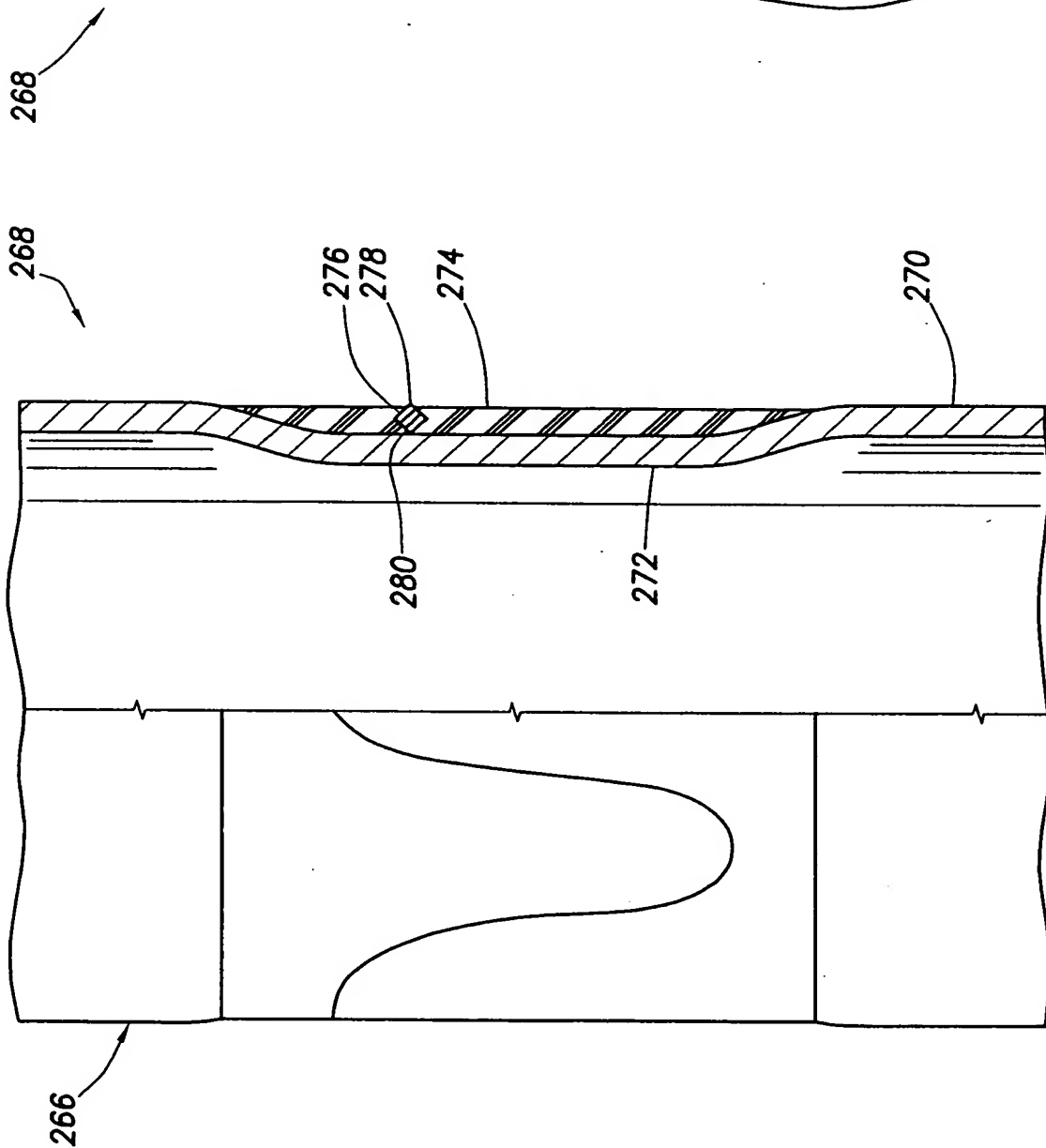


FIG. 6B

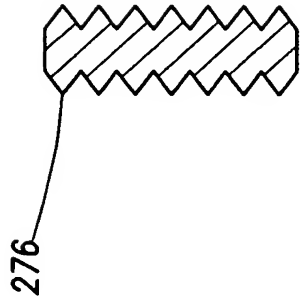


FIG. 6E

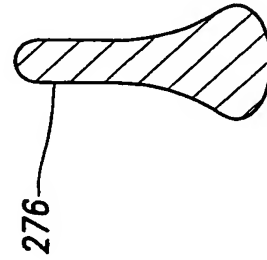


FIG. 6F

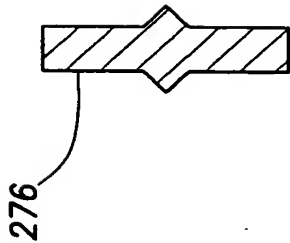


FIG. 6C

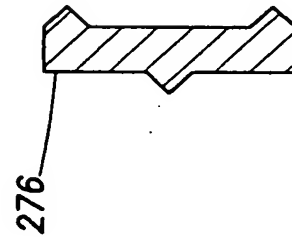


FIG. 6D

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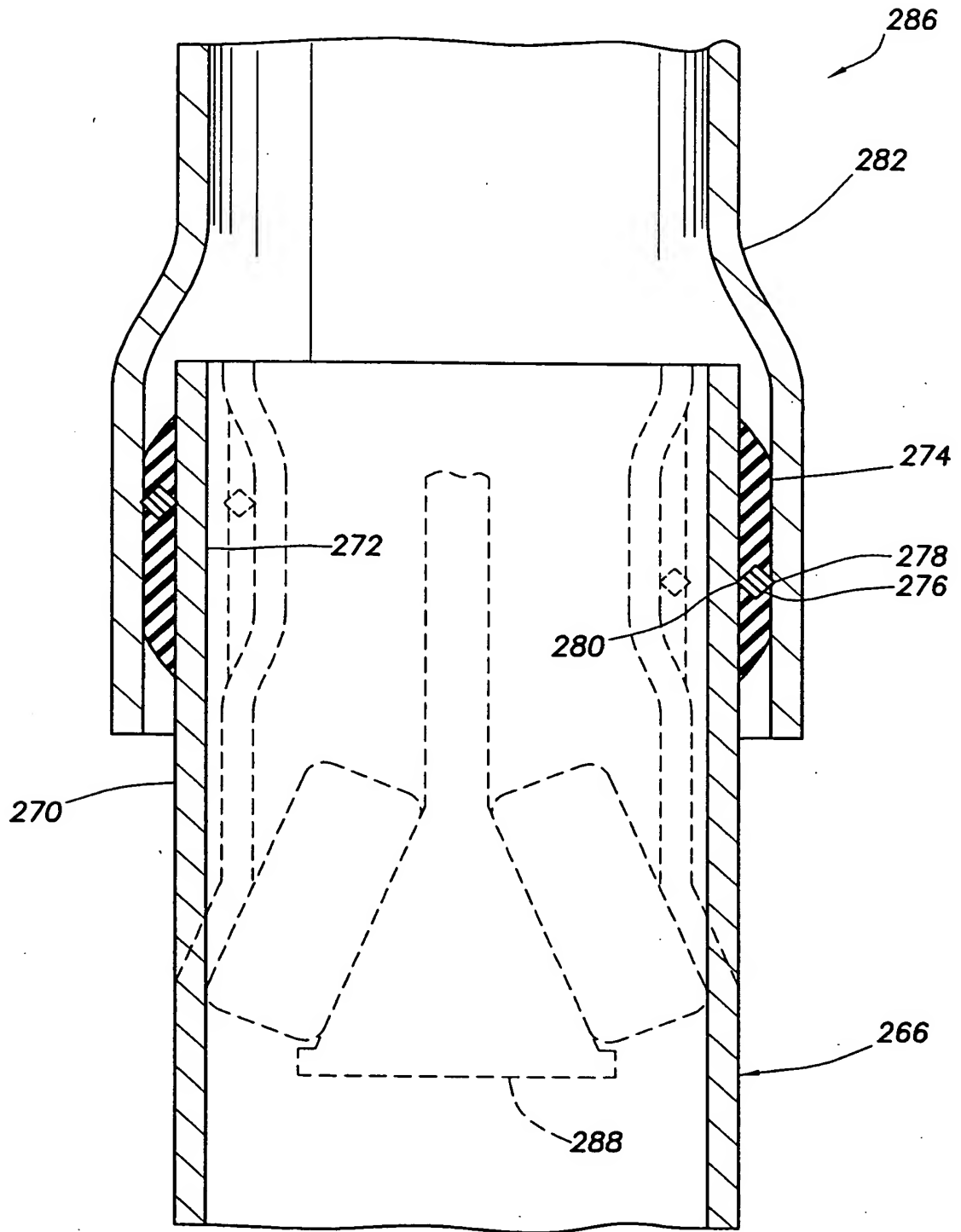
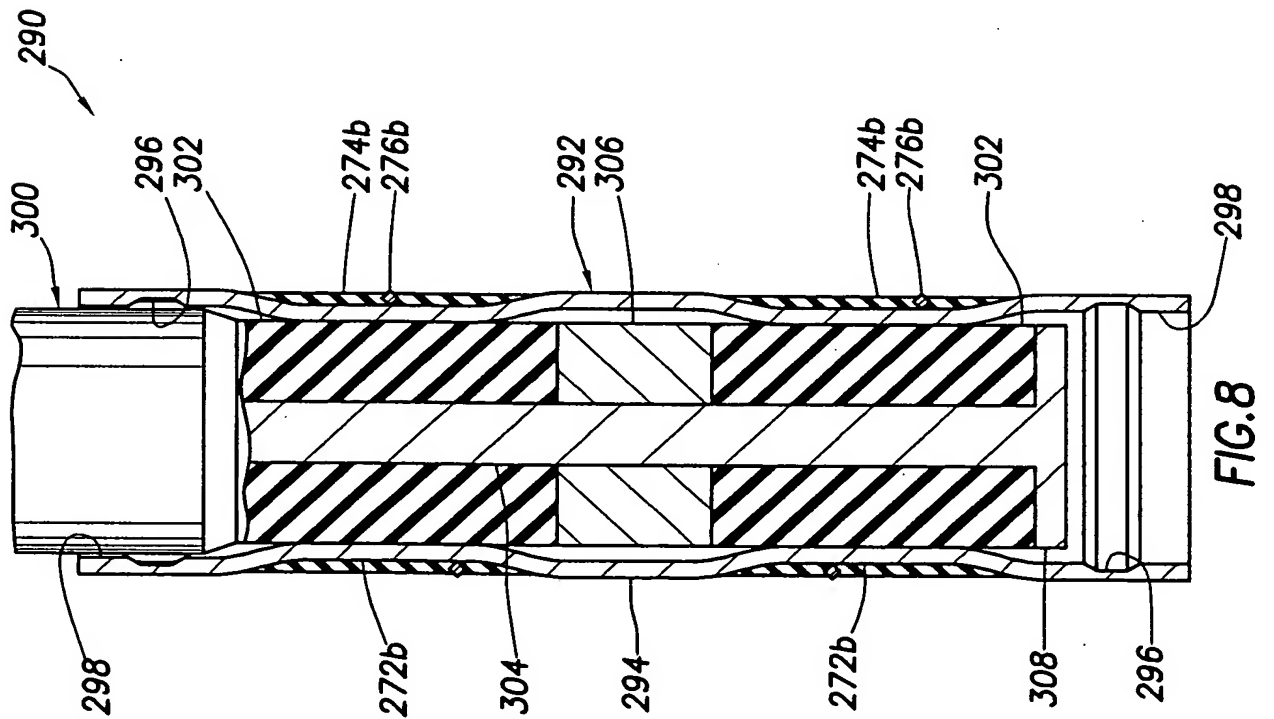
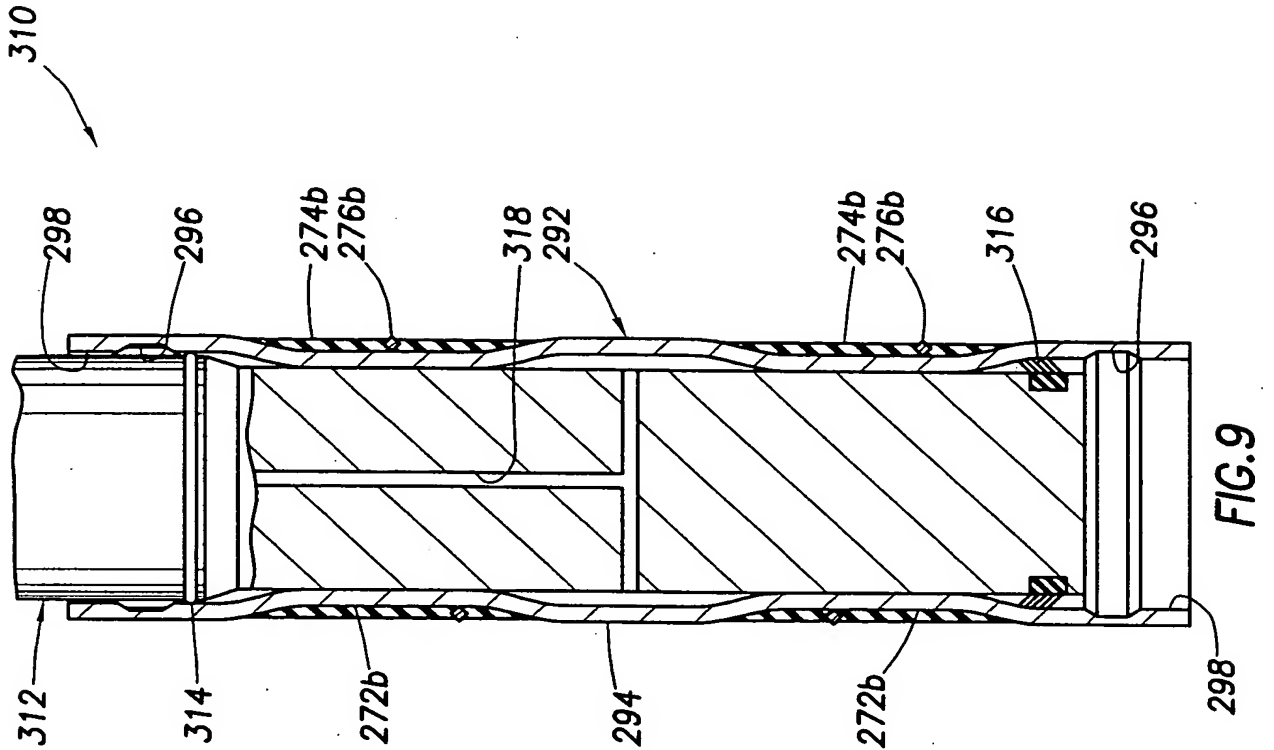


FIG. 7

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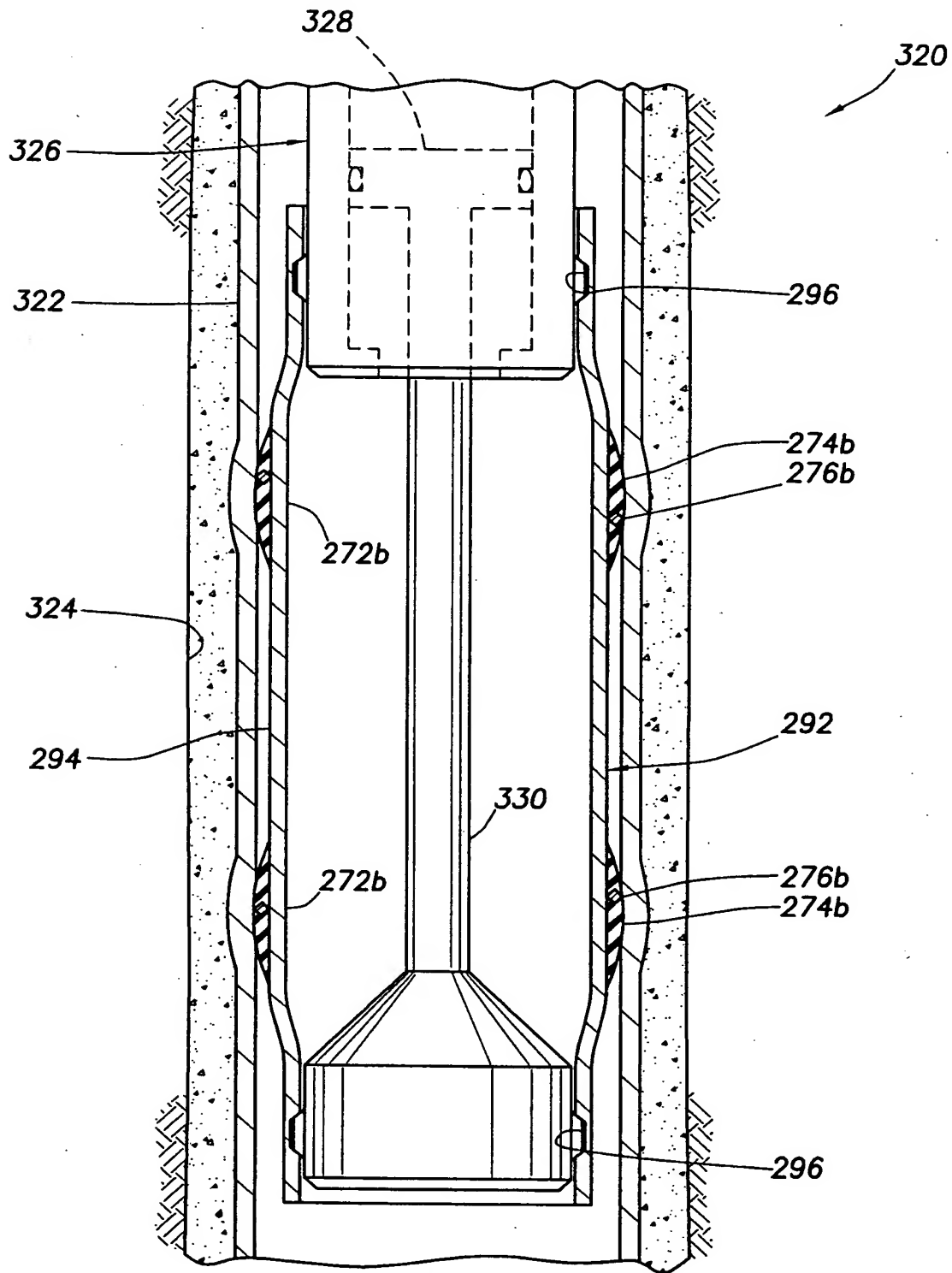


FIG. 10